



SEA LEVEL RISE 2012 UPDATE

CITY OF OLYMPIA / WATER RESOURCES
NOVEMBER, 2012

Budd Inlet...High Tide



Budd Inlet



City Policies...2010

- Protect downtown
 - Understand implications of 50 inches of sea rise
- Incorporate flexibility into public and private infrastructure
 - Building elevations, setbacks, stormwater design
- Maintain control of valuable shorelines

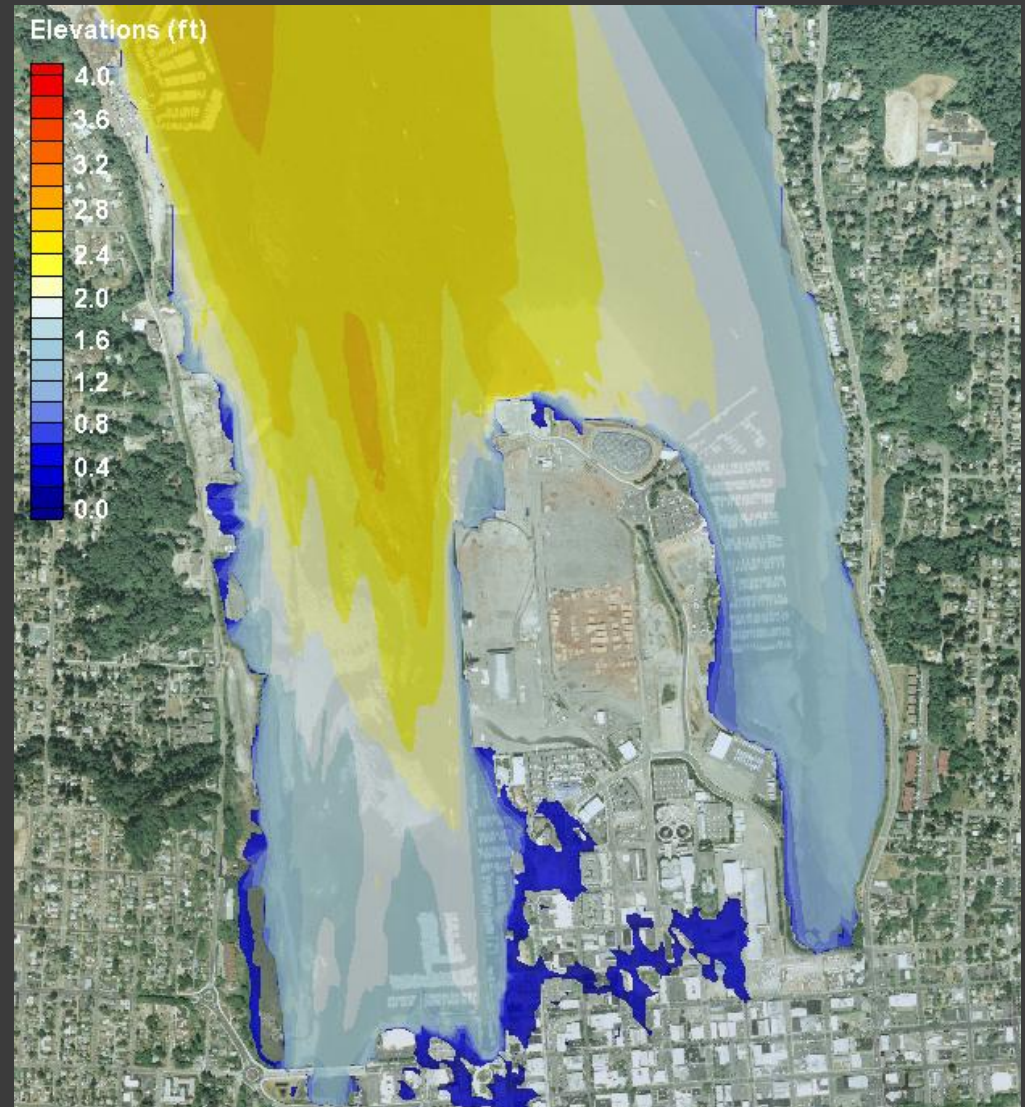
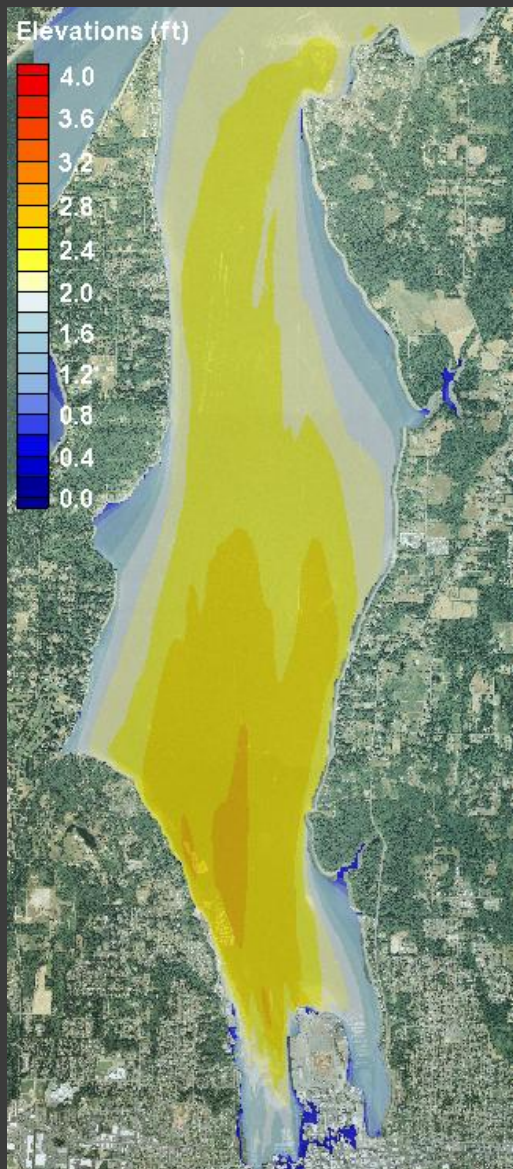
Work Plan

- Complete an engineering analysis of potential sea walls
- Progression of responses to 50 inches of sea rise
- Incorporate sea rise issues in Comprehensive Plan and Shoreline Master Program revisions

Budd Inlet Flood Dynamics

- ◉ *Tides*: Extreme events, storm surge, historical events
- ◉ *Wind and waves*: Water levels, shoreline interactions and overtopping
- ◉ *Rainfall and runoff*
- ◉ *Piped Indian/Moxlie Creek*
- ◉ *Deschutes River/Capitol Lake*
- ◉ *Sea level rise*

100-Year Event Wind and Waves



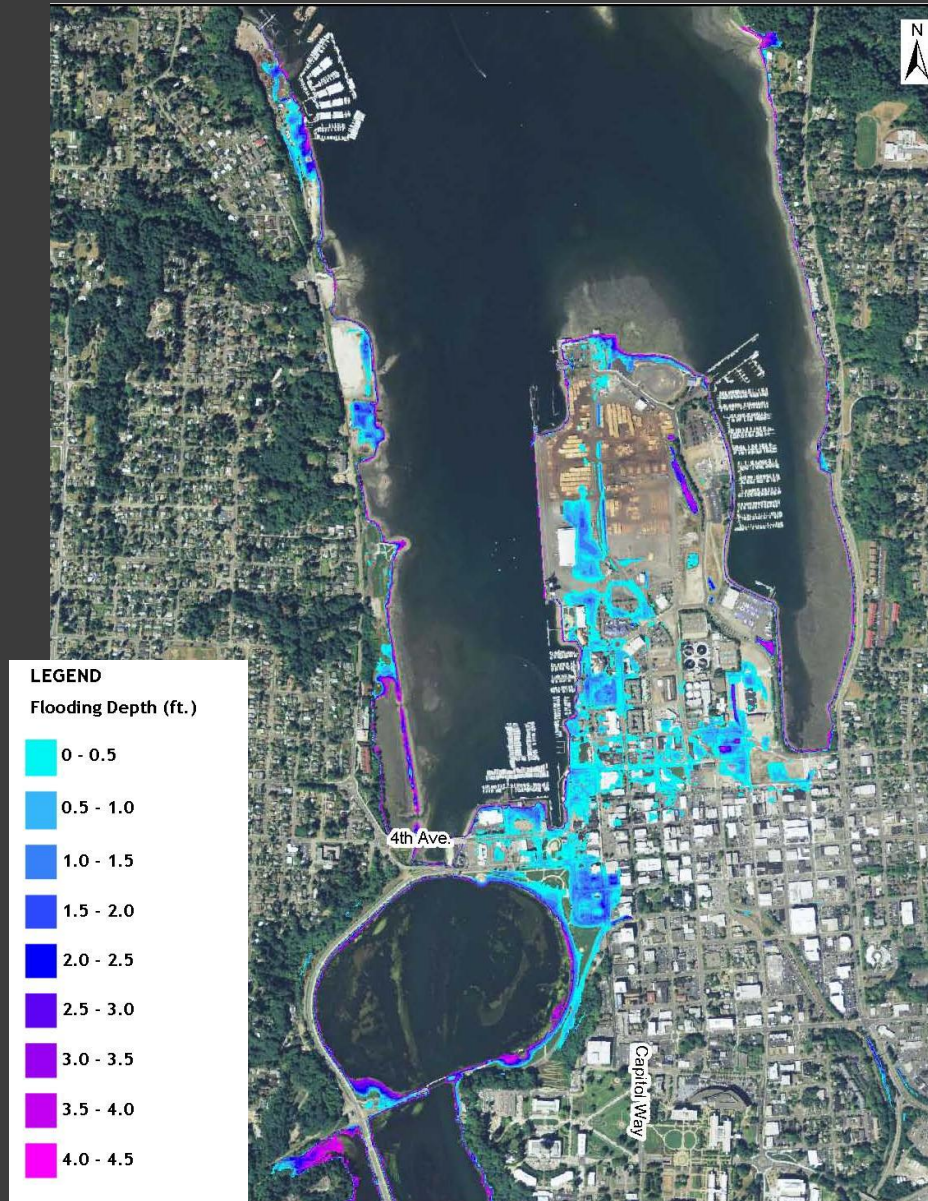
Combining Flooding Risks

- Many possible combinations
 - Modest tide with precipitation and sea rise
 - Extreme tide with wind and waves
 - Influence of sea level rise...0.25, 0.5, 1, 2, and 4 feet
- Highlights sensitivities and hot spots

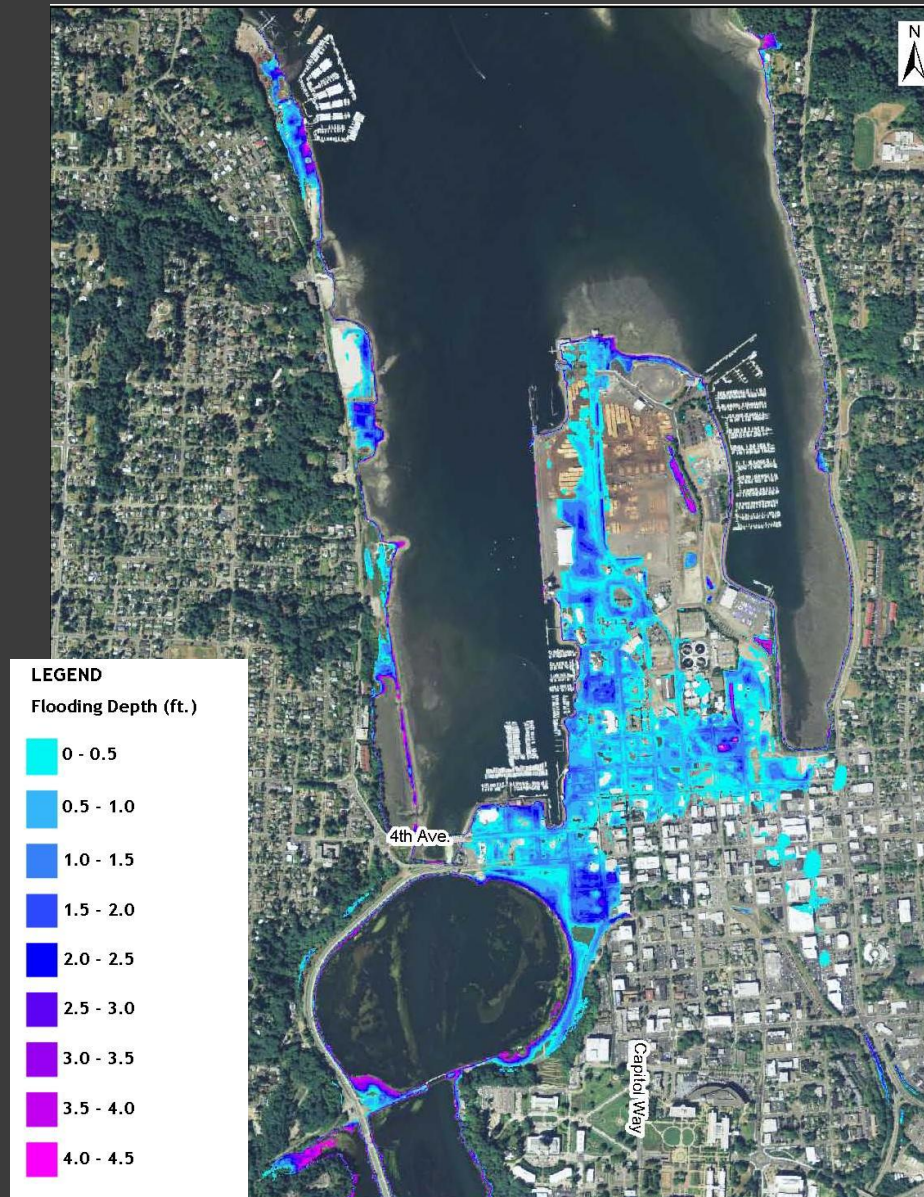
Linking Water Elevations to Downtown Landscape

- ◉ Land elevation
- ◉ Land use
- ◉ Essential services...emergency transportation corridors, LOTT, City Hall, pump stations
- ◉ Stormwater and wastewater systems

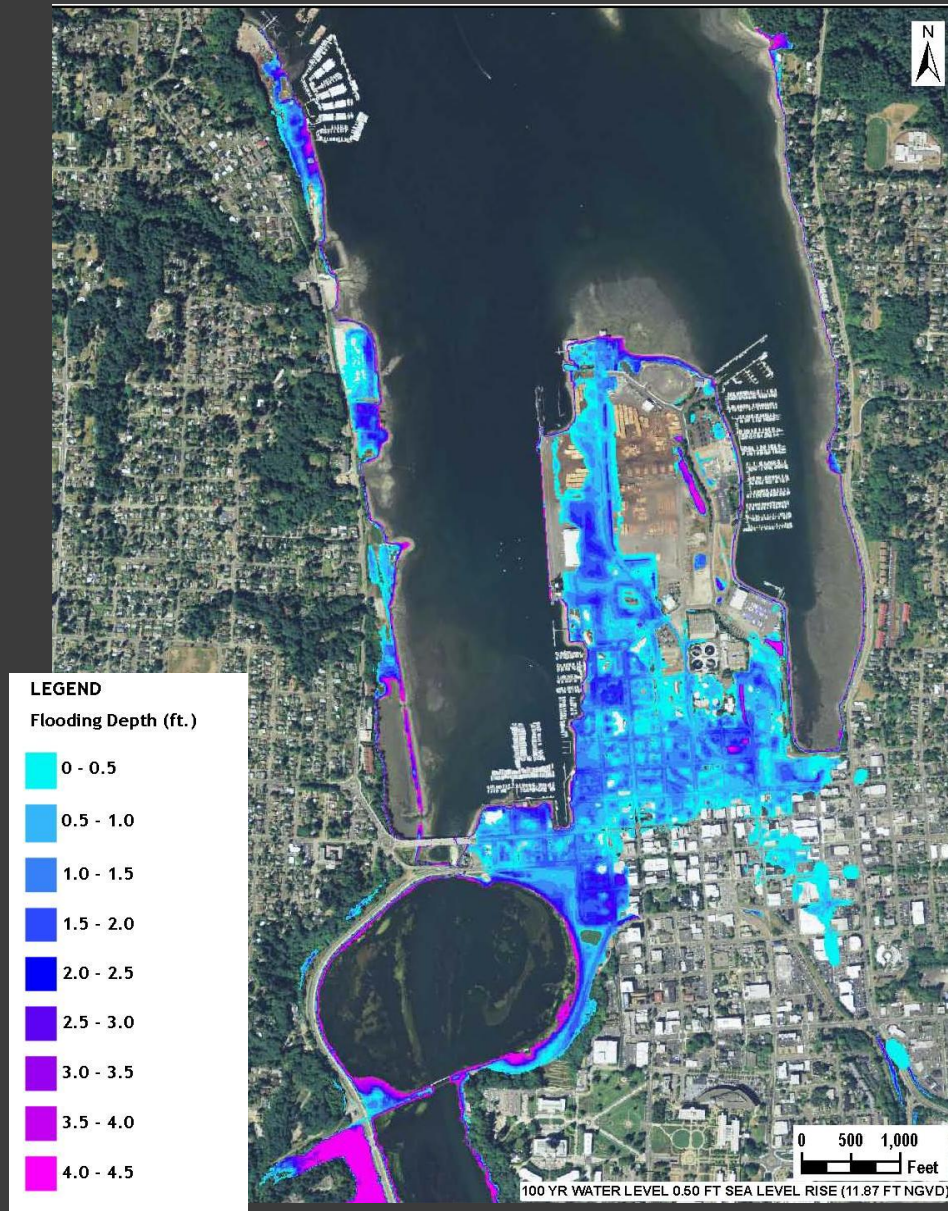
Existing 10 Year Tide Event



Existing 100 Year Tide Event



100 Year Tide Event with 0.5 Feet Sea Rise



Indian/Moxlie Creek Hot Spots



Stormwater and Wastewater



Outcomes...

Expected and Unexpected

- Refined understanding of flood dynamics and risks
- Good foundation for future management
- Greater sense of urgency than expected
 - Downtown is currently vulnerable

Response Strategy – Now and Up to 0.25 feet of Sea Rise

- Temporary emergency responses:
 - Seal storm drains at specific locations
 - Reduce stormwater backflows and flows to the wastewater system
 - Pump as needed
 - Sandbag low-lying shorelines
- Continue with small projects...consolidate stormwater outfalls, heighten shorelines

Response Strategy – More than 0.25 feet of Sea Rise

- Emergency response becomes impractical:
 - Construct priority sea walls to 1 foot
 - Install tide gates and small pumps
 - Upgrade shoreline for utilities, structural stability
 - Manage Indian/Moxlie Creek flooding

Initial Sea Wall Construction



Response Strategy – More than 0.5 feet of Sea Rise

- Increase sea wall construction
 - Expand and heighten sea walls
 - Continue installing tide gates and pump stations
 - Plan for the large Indian/Moxlie Creek pump station or rerouting street drains
 - Continue consolidating stormwater systems

Response Strategy – Over 1 Foot of Sea Rise

- Implement downtown-wide protection
 - Protect the rest of peninsula
 - Construct Indian/Moxlie pump
 - Increase height of existing sea walls

Long-term Sea Wall Approach



Potential High Costs

- ◎ Sea Walls
 - Initially....+/- \$8 million
- ◎ Pump Stations....\$37 million

Summary

- ⦿ Higher existing risks than anticipated
- ⦿ Improve emergency responses now
- ⦿ Plan for capital projects in 10 to 15 years
- ⦿ Not surprisingly, costs are high

Andy Haub
City of Olympia
753-8475
ahaub@ci.olympia.wa.us